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ABSTRACT

The document is a guide to the products developed, adopted, and/or adapted by the Management Information System for Occupational Education (MISOE), a major development effort to improve the policy-making function at the State level, undertaken in Massachusetts in 1971 and ended in 1975. MISOE sought to combine three large data sets (a census data system, a longitudinal sample data system, and an ex post facto data set) on a single computer with interactive capability, bringing to the policymakers' fingertips a range of psychological, economic, and demographic data and providing them with a knowledge base for "parametizing" forecast models. Designed primarily for secondary education, the system is considered to be generalizeable to postsecondary and adult education. MISOE developed and/or organized a substantial number of tools required to implement a comprehensive management information system; the paper describes these and cites sources for full documentation. The guide assumes familiarity with the general MISOE structure in its references. (Author/AJ)

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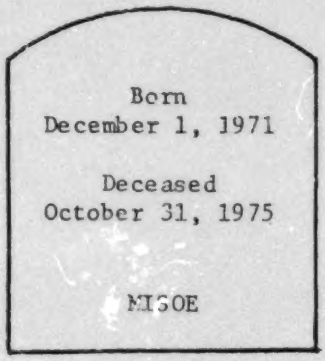
The Management Information System

for

Occupational Education



A Guide to Products Developed, Adopted

and/or Adapted by MISOE

October 21, 1975

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ACKNOWLEDGMENTS

MISOE was created by a number of people. The Census Data System was conceptualized by Martin Breslow, Gerald Downey and William Kyros. William Kyros developed TERMOBS and made real the conceptualized Census Data System. The Sample Data System was developed by Elizabeth Weinberger and John Creager. The modeling capability was the work of Michael Garet. David Tiedeman offered useful advice throughout MISOE's total experience. The Cost Accounting System was developed by Gerald Downey, while economic analysis potential was structured with the help of Jack Kaufman. The computer side was worked on by Martin Breslow, Maurice Shirley and John Donovan, with Professor Donovan's development at M.I.T. representing the computer capability required by MISOE.

Many administrators and teachers helped field test and, indeed, develop much of MISOE. Special thanks are due: Nashoba Valley Regional Technical High School; the Quincy schools; the Newton schools, Northeast Metropolitan Regional Vocational Technical High School; Shawsheen Valley Vocational Technical High School; Greater Lawrence Vocational Technical High School and the Brookline schools.

Finally, without the support of Charles Buzzell (former Associate Commissioner for Occupational Education in Massachusetts), MISOE would have never been. I am sure I speak for all those who have worked on MISOE in hoping that others will find our work of value to improving Occupational Education in America.

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The management information system for occupational education (MISOE) represented a major development effort on the part of Massachusetts to improve the policy making function at the state level. MISOE began in December of 1971 and ended on October 31, 1975. MISOE developed and/or organized a substantial number of tools required to implement a comprehensive management information system. The purpose of this paper is to describe these tools and reference specific sources where full documentation can be found. Although MISOE was designed primarily for secondary education, most of it is generalizable to post-secondary and adult education.

A Description of MISOE

MISOE sought to combine three large data sets on a single computer, with an interactive capability:

(1) A Census Data System - which describes enrollments, attrition, expenditures and skills learned on an occupational program/school level;

(2) A Longitudinal Sample Data System - which describes in detail the independent effect of specific occupational and non-occupational education programs on students and society;

(3) An Ex Post Facto Data Set - which describes the independent effect of specific occupational education programs on students and society. This data set was considered "interim" to the maturation of the Longitudinal Sample Data System.

Essentially MISOE sought to bring to the finger tips of the policy maker for occupational education, through an interactive computer system, a

range of information which not only accounted for experience from a variety of psychological, economic and demographic data perspectives, but provided a knowledge base for "paramatizing" forecast models (both recursive and feedback). MISOE is thoroughly documented in the Journal of Research and Development in Education, Winter, 1974, Athens, Georgia, Vol. 7, No. 2 (CE 005 688). In referring to many of the tools developed - adopted and/or adapted by MISOE in this guide, an assumption of familiarity with the general MISOE structure as described in this Journal is made.

Documentation for MISOE sub-sections are either available in ERIC and/or available through the Division of Occupational Education, Massachusetts Department of Education, 178 Tremont Street, Boston, Massachusetts 02111 (MDE). Each document is available through MDE, while those that are included within ERIC are identified with the appropriate ERIC document identification number.

MISOE Documents

I. As MISOE was conceptualized, a series of developmental papers were written:

(A) An Integrated State and Local Management Information System for Occupational Education in Massachusetts-A Monograph.

William G. Conroy, Jr.

November, 1971 (ED 062553)

(B) Occasional Papers

(1) Population - Sample Relations and Data Types

William G. Conroy, Jr.

January, 1972 (CE 005691)

(2) Task Differentiations

William G. Conroy, Jr.

February, 1972 (CE 005 692)

(3) A Very Tentative Computer System Model

Martin P. Breslow

February, 1972 (CE 005 693)

(4) The Concept of Process Space As It Pertains to the IPPI Model of Education

Elizabeth Weinberger

February, 1972 (CE 005 694)

(5) Delineation of MISOE's Static Space

Elizabeth Weinberger

Gerald F. Downey

William G. Conroy, Jr.

April 1972 (ED 068 647)

(6) MISOE In Motion

William G. Conroy, Jr.

Elizabeth Weinberger

June 1, 1972 (ED 068 646)

(7) Non-Economic Analysis Considerations for MISOE

John A. Creager

June, 1972 (ED 072 228)

(8) An Organization for Dynamic Simulation

David V. Tiedeman

September 11, 1972 (ED 072304)

(9) Conceptual Issues in Cost-Benefit Analysis

Jacob J. Kaufman

Elchanan Cohn

September, 1972 (ED 072303)

(10) Sampling and Weighting Considerations for MISOE

John A. Creager

July, 1972 (ED 072225)

II. Chapter 9 in the Journal of Research and Development in Education is based upon a paper entitled, "Occupational Life in Massachusetts". All the equations and computer programs required to "run the model" are available through MDE on computer tape or appended to "Occupational Life in Massachusetts" by Michael Garet, Sept. 1973. (CE005689)(1)

III. The Census Data System, as described in Chapter 3, includes TERMOBS for 20 occupational education programs and a cost-analysis system to specify cost by occupational education program. It has been fully field tested and is ready for implementation. Although the Census Data System was developed to fit into the existing MDE Census Data System for all education, it should be generalizable, with modifications, to all states.

(1) A dynamic simulation model developed by Michael Garet, entitled the Growth of an Occupational Education Program, March, 1973 was written and is document (CE 005690). All the equations to "run the model" are in this paper.

A. Annotated Documentation

The purpose of the annotation is to describe the contents of the documents that comprise the Census Data System of MISOE.[2] Certain developmental reports are also included for supportive purposes. These reports contain the results of field tests which were conducted to determine the feasibility of data collection methods.

1. Census Data System of the Management Information System for Occupational Education: Guidelines and Instructions for Reporting

   This document provides (a) an overview of MISOE; (b) an explanation of concepts that are essential to the understanding of the MISOE Census Data System and (c) detailed step-by-step instructions for the completion of the data reporting forms. (CE 005 701)

2. Fall School Head Report - Reporting Booklet 1.0

   Reporting Booklet 1.0 contains the reporting forms which collect basic enrollment, staff, and building facilities data from school heads, viz., principals and/or directors. (CE 005 705)

3. Fall Department Head Report - Reporting Booklet 2.0

   Reporting Booklet 2.0 contains the reporting forms which collect data that describe program structure and job-entry skill outcomes expected of program completors. Utilization of instructional area is also determined. These booklets contain the terminal performance objectives or TERMOBS which have been written for twenty program areas. They are

[2] William Kyros wrote the CDS documentation, with assistance from Gerald Downey.

actually the forms by which the skills of program completors are reported by department heads. (CE 005 706)

4 & 5. End-of-Year School Report - Reporting Booklet 3.0, Parts A & B. (CE 005 724-A)

Reporting Booklet 3.0 contains the reporting forms which collect student data that are available at the end of the school year such as completors and dropouts by school (Part A). In addition, school expenditure data forms are also included (Part B). (CE 005 725-B)

6 & 7. End-of-Year Department Report - Reporting Booklet 4.0, Parts A & B.

Reporting Booklet 4.0 contains reporting forms which collect student data by department. These include data on completors and dropouts (Part A). Expenditure data by department are also collected by this booklet (Part B).

(CE 005 726
CE 005 727)

8. Field Test Results of the MISOE Census Data System, Fall Report, June, 1974.

This document describes the results of the field test of the MISOE Census Data System Fall Reports which was conducted during May and June of 1974. It includes, as an addendum, an evaluation of an initial concept of the Census Data System which was performed by the Department of Education staff in January of 1974. (CE 005 702)

9. Workshop Guidelines for the MISOE Census Data System, Fall Report, August, 1974.

This document describes the process by which a portion of the MISOE Census Data System, viz., the Fall Reports, was field tested in a sample of six schools. This publication is intended to provide the basis from which a full-scale plan for statewide implementation may be modeled.

(CE 005 703)

10. Field Test Results of the MISOE Program Cost Estimating System, August, 1975.

This document describes the results of the field test of the MISOE Census Data System End-of-Year Reports which was conducted in May and June of 1975. The feasibility of the system to collect expenditure data and to determine individual program costs in a typical regional vocational school was demonstrated and the program costs are reported.

(CE 005 704)

IV. The Sample Data System (as described in Chapter 4 of the Journal of Research and Development in Education) instrumentation was developed and/or adopted for the input and process batteries. Further, guidelines for administering these batteries were developed and all batteries were formatted on optical scannable forms with computer programs written to "unscramble" data from these optical scannable forms to computer tape. "A Data Entry System for the Sample Data System of MISOE" by John Creager specifies the data format from instrumentation to the computer file. (CE 005 700)

The input and process batteries and guidelines for administering these batteries can be found in two documents:

A. The Input and Process Batteries for MISOE Sample Data Systems. (CE 005699)

B. The Process Batteries Operations Report (CE 005698)

These documents include the optical scannable forms and a detailed description for administering each instrument for both batteries. The "unscramble" programs for reading the data from the optical scannable forms to a computer tape are not fully completed, but are available from MDE. They were tested on "fudge" data, and would be helpful to anyone initiating a longitudinal sample with the instruments developed and/or adopted by MISOE

The process for identifying students across batteries and nesting students against process data within a computer file is tricky business. The documentation provided to ERIC and a little imagination ought to be sufficient, but a couple of working papers are available through MDE which have not been included in ERIC.

The MISOE Impact Battery was fully developed, and is currently being used in generating the Ex Post Facto Data Set in a project called "The Transition of Youth from School to Work in Massachusetts." These instruments (including an instrument to summarize some input, process and product data for this "interim" data set) is document (CE 005697).

Further, these data are mounted on the GMIS interactive information system, developed by the Center for Information Systems Research of Sloan School at M.I.T. (see V).

A final technical and summarizing report for this "interim" Ex Post Facto Data Set is available through MDE.

V. Two documents describe the computer technology recommended to accomplish the goals of MISOE:

A. Computer Specifications for the MISOE Prototype System by Maurice Shirley (CE005696) describes specifications and alternatives considered.

B. GMIS, An Experimental System for Data Management and Analysis, by John J. Donovan and Henry D. Jacoby, of the Sloan School of Management, M.I.T., September, 1975, describes the "software" recommended for MISOE application. It includes all the capabilities required, has been field tested, and is currently being used for the "Transition" study. Although "Transition" is a limited data set (several hundred observations on about three thousand students), it is fully exercising GMIS for MISOE application. (CE 005695)